

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
L1	340	(370/431).CCLS.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2005/03/11 20:49
L2	0	(select\$5 near9 (backup back-up alternat\$5) near9 path\$5 near9 (profile\$5 prefer\$5)) and 1	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2005/03/11 20:53
L3	0	(select\$5 near9 (backup back-up different\$5 alternat\$5) near9 path\$5 near9 (profile\$5 prefer\$5)) and 1	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2005/03/11 20:51
L4	2430	(709/227).CCLS.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2005/03/11 20:52
L5	2	("20020010792").PN.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2005/03/11 20:52
L6	1976	(709/238).CCLS.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2005/03/11 20:53
L7	1	(select\$5 near9 (backup back-up alternat\$5) near9 path\$5 near9 (profile\$5 prefer\$5)) and 6	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2005/03/11 20:53
S19	2	("6418324").PN.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2005/03/11 20:48

S28	7	select\$5 near3 alternat\$5 near3 path\$5 near4 (profile\$5 prefer\$5)	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2005/03/11 10:55
S29	18	select\$5 near9 (backup back-up alternat\$5) near9 path\$5 near9 (profile\$5 prefer\$5)	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2005/03/11 20:49
S30	67	select\$5 near9 (backup back-up different\$5 alternat\$5) near9 path\$5 near9 (profile\$5 prefer\$5)	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2005/03/11 20:50
S31	33	S30 and @ad<"20000721"	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2005/03/11 11:09

S9	0	((session\$5 link\$5 path\$3) near (select\$5 choos\$5))) and "6272148".pn.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2005/03/10 13:48
S10	0	((session\$5 link\$5 path\$3) near9 (select\$5 choos\$5))) and "6272148".pn.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2005/03/10 11:38
S11	930	((session\$5 link\$5 path\$3) near4 (select\$5 choos\$5))) with profile\$5	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2005/03/10 11:38
S12	109	(rout\$3 near3 (information\$3 data)) and S11	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2005/03/10 11:39
S13	49	S12 and @ad<"20000815"	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2005/03/10 13:48
S14	74	tcp adj2 spoof\$5	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2005/03/10 14:20
S15	26	((session\$5 link\$5 path\$3) near4 (select\$5 choos\$5))) and S14	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2005/03/10 13:48
S16	4	S15 and @ad<"20000815"	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2005/03/10 14:12

S17	19	S14 and @ad<"20000815"	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2005/03/10 14:32
S18	381	(path\$3 link\$3 session\$3 connection\$3) near3 select\$5 near3 profile\$3	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2005/03/10 14:21
S19	3	(path\$3 link\$3 session\$3 connection\$3) near3 select\$5 near3 profile\$3 with (gateway\$3 proxy)	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2005/03/10 14:22
S20	17	(path\$3 link\$3 session\$3 connection\$3) near3 select\$5 near3 profile\$3 with (rule\$3 polic\$5)	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2005/03/10 14:30
S21	4	((("6473795") or ("6058243")).PN.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2005/03/10 14:28
S22	334	((path\$3 link\$3 session\$3 connection\$3) near8 select\$5 near9 profile\$3) and (rule\$3 polic\$5)	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2005/03/10 14:31
S23	110	S22 and @ad<"20000815"	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2005/03/10 14:33
S24	18	S22 and @ad<"20000815" and "709"/\$.ccls.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2005/03/10 14:39

S25	17	"6094687".uref.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2005/03/10 14:47
S26	1	"6094687".uref. and (gateway proxy)	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2005/03/10 14:49
S27	2	"6590867".uref.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2005/03/10 16:40
S28	3	"9858474"	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2005/03/10 16:40

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
S1	45	"tcp spoofing"	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2005/03/10 13:47
S2	52874	((session\$5 link\$5 path\$3) near (select\$5 choos\$5))	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2005/03/10 11:30
S3	93488	(rout\$3 near3 (information\$3 data))	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2005/03/10 11:39
S4	980	S2 and S3 and profile\$3	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2005/03/09 18:03
S5	11	S2 and S3 and profile\$3 and S1	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2005/03/09 18:19
S6	2	("0903905").PN.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2005/03/09 18:20
S7	9	"0903905"	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2005/03/09 18:21
S8	24	"903905"	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2005/03/09 18:21

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
L21	8	"9311622"	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2005/03/11 17:35
L45	1	(common adj3 (traffic\$3) near connection)	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2005/03/11 20:18
L46	13	(common adj3 (traffic\$3) near9 connection)	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2005/03/11 20:20
L47	27	(common adj traffic\$3) with (group\$5 cluster\$3)	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2005/03/11 20:20
L49	99	(common adj traffic adj channel)	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2005/03/11 20:32
L54	0	'same' adj traffic near9 (different adj channel\$5)	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2005/03/11 20:43


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1 [METRO: a router architecture for high-performance, short-haul routing networks](#)

A. DeHon, F. Chong, M. Becker, E. Egozy, H. Minsky, S. Peretz, T. F. Knight

 April 1994 **ACM SIGARCH Computer Architecture News , Proceedings of the 21ST annual international symposium on Computer architecture**, Volume 22 Issue 2

Full text available: pdf(1.15 MB)

 Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

The *Multipath Enhanced Transit Router Organization (METRO)* is a flexible routing architecture for high-performance, tightly-coupled, multiprocessors and routing hubs. A *METRO* router is a dilated cross-bar routing component supporting half-duplex bidirectional, pipelined, circuit-switched connections. Each *METRO* router is self-routing and supports dynamic message traffic. The routers work in conjunction with source-responsible network interfaces to achieve reliable en ...

2 [A comparison of overlay routing and multihoming route control](#)

Aditya Akella, Jeffrey Pang, Bruce Maggs, Srinivasan Seshan, Anees Shaikh

 August 2004 **ACM SIGCOMM Computer Communication Review , Proceedings of the 2004 conference on Applications, technologies, architectures, and protocols for computer communications**, Volume 34 Issue 4

Full text available: pdf(1.07 MB)

 Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

The limitations of BGP routing in the Internet are often blamed for poor end-to-end performance and prolonged connectivity interruptions. Recent work advocates using overlays to effectively bypass BGP's path selection in order to improve performance and fault tolerance. In this paper, we explore the possibility that intelligent control of BGP routes, coupled with ISP multihoming, can provide competitive end-to-end performance and reliability. Using extensive measurements of paths between nodes i ...

Keywords: multihoming, overlay routing, route control

3 [A constant-factor approximation algorithm for packet routing, and balancing local vs. global criteria](#)

Aravind Srinivasan, Chung-Piaw Teo

 May 1997 **Proceedings of the twenty-ninth annual ACM symposium on Theory of computing**

Full text available: pdf(1.32 MB)

 Additional Information: [full citation](#), [references](#), [citations](#), [index terms](#)

Keywords: approximation algorithms, covering integer programs, discrete ham-sandwich theorems, linear programming, packet routing, randomized algorithms, randomized rounding, rounding theorems

4 Routing: Path set selection in mobile ad hoc networks

Panagiotis Papadimitratos, Zygmunt J. Haas, Emin Gün Sirer

June 2002 **Proceedings of the 3rd ACM international symposium on Mobile ad hoc networking & computing**

Full text available:  [pdf\(300.24 KB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)


Topological changes in mobile ad hoc networks frequently render routing paths unusable. Such recurrent path failures have detrimental effects on the network ability to support QoS-driven services. A promising technique for addressing this problem is to use multiple redundant paths between the source and the destination. However while multipath routing algorithms can tolerate network failures well their failure resilience only holds if the paths are selected judiciously. In particular the correlation ...

Keywords: mobile ad hoc networks, path set selection, reliability

5 Resilient overlay networks

David Andersen, Hari Balakrishnan, Frans Kaashoek, Robert Morris

October 2001 **ACM SIGOPS Operating Systems Review , Proceedings of the eighteenth ACM symposium on Operating systems principles**, Volume 35 Issue 5

Full text available:  [pdf\(1.50 MB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

A Resilient Overlay Network (RON) is an architecture that allows distributed Internet applications to detect and recover from path outages and periods of degraded performance within several seconds, improving over today's wide-area routing protocols that take at least several minutes to recover. A RON is an application-layer overlay on top of the existing Internet routing substrate. The RON nodes monitor the functioning and quality of the Internet paths among themselves, and use this information ...

6 Design and performance of multipath MIN architectures

Frederic T. Chong, Thomas F. Knight

June 1992 **Proceedings of the fourth annual ACM symposium on Parallel algorithms and architectures**

Full text available:  [pdf\(1.05 MB\)](#) Additional Information: [full citation](#), [references](#), [citations](#), [index terms](#)

7 Scalable expanders: exploiting hierarchical random wiring

Eric A. Brewer, Frederic T. Chong, Tom Leighton

May 1994 **Proceedings of the twenty-sixth annual ACM symposium on Theory of computing**

Full text available:  [pdf\(941.42 KB\)](#) Additional Information: [full citation](#), [references](#), [citations](#), [index terms](#)

8 Congestion: Best-path vs. multi-path overlay routing

David G. Andersen, Alex C. Snoeren, Hari Balakrishnan

October 2003 **Proceedings of the 3rd ACM SIGCOMM conference on Internet**

measurementFull text available:  [pdf\(142.64 KB\)](#)Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

Time-varying congestion on Internet paths and failures due to software, hardware, and configuration errors often disrupt packet delivery on the Internet. Many approaches to avoiding these problems use multiple paths between two network locations. These approaches rely on a path-independence assumption in order to work well; i.e., they work best when the problems on different paths between two locations are uncorrelated in time. This paper examines the extent to which this assumption holds on the Internet.

Keywords: measurement, multi-path routing, networking, overlay networks

9 Empirical study of traffic trunking in Linux-based MPLS test-bed

G. Rosenbaum, S. Jha, M. Hassan

July 2003 **International Journal of Network Management**, Volume 13 Issue 4Full text available:  [pdf\(128.04 KB\)](#)Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

The thrust of this study is to construct an MPLS test-bed using open hardware and software and later use this test-bed for experimenting with various traffic engineering options available with MPLS. We have constructed a test-bed using Pentium PCs and Linux and used this test-bed to try a well-known MPLS traffic engineering feature of separating flows into multiple trunks. The purpose of this separation is to experimentally assess the quality of service benefits we can expect from MPLS networks.

10 Informed content delivery across adaptive overlay networks

John W. Byers, Jeffrey Considine, Michael Mitzenmacher, Stanislav Rost

October 2004 **IEEE/ACM Transactions on Networking (TON)**, Volume 12 Issue 5Full text available:  [pdf\(645.82 KB\)](#)Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

Overlay networks have emerged as a powerful and highly flexible method for delivering content. We study how to optimize throughput of large transfers across richly connected, adaptive overlay networks, focusing on the potential of collaborative transfers between peers to supplement ongoing downloads. First, we make the case for an erasure-resilient encoding of the content. Using the digital fountain encoding approach, end hosts can efficiently reconstruct the original content of size $>n$.

Keywords: bloom filter, content delivery, digital fountain, erasure code, min-wise sketch, overlay, peer-to-peer, reconciliation

11 Optimizing cost and performance for multihoming

David K. Goldenberg, Lili Qiu, Haiyong Xie, Yang Richard Yang, Yin Zhang

August 2004 **ACM SIGCOMM Computer Communication Review , Proceedings of the 2004 conference on Applications, technologies, architectures, and protocols for computer communications**, Volume 34 Issue 4Full text available:  [pdf\(429.05 KB\)](#)Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

Multihoming is often used by large enterprises and stub ISPs to connect to the Internet. In this paper, we design a series of novel *smart routing* algorithms to optimize cost and performance for multihomed users. We evaluate our algorithms through both analysis and extensive simulations based on realistic charging models, traffic demands, performance data, and network topologies. Our results suggest that these algorithms are very effective in minimizing cost and at the same time improving ...

Keywords: algorithms, multihoming, optimization, smart routing

12 Efficient routing in optical networks



Alok Aggarwal, Amotz Bar-Noy, Don Coppersmith, Rajiv Ramaswami, Baruch Schieber, Madhu Sudan

November 1996 **Journal of the ACM (JACM)**, Volume 43 Issue 6

Full text available: [pdf\(559.18 KB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#), [review](#)

This paper studies the problem of dedicating routes to connections in optical networks. In optical networks, the vast bandwidth available in an optical fiber is utilized by partitioning it into several channels, each at a different optical wavelength. A connection between two nodes is assigned a specific wavelength, with the constraint that no two connections sharing a link in the network can be assigned the same wavelength. This paper considers optical networks with and without switches, a ...

Keywords: optical networks, routing, wavelength assignment

13 Testing and Fault-Tolerance: Test generation for resistive opens in CMOS



Arun Krishnamachary, Jacob A. Abraham

April 2002 **Proceedings of the 12th ACM Great Lakes symposium on VLSI**

Full text available: [pdf\(100.35 KB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

This paper develops new techniques for detecting both stuck-open faults and resistive open faults, which result in increased delays along some paths. The improved detection of CMOS open defects is made possible by a new delay fault model which combines the advantages of the gate delay fault model and the path delay fault model. We develop a test generation methodology for this fault model which enables generation of test vectors that test a percentage of the longest sensitizable paths in the des ...

Keywords: defect detection, delay testing, resistive opens

14 Informed content delivery across adaptive overlay networks



John Byers, Jeffrey Considine, Michael Mitzenmacher, Stanislav Rost

August 2002 **ACM SIGCOMM Computer Communication Review , Proceedings of the 2002 conference on Applications, technologies, architectures, and protocols for computer communications**, Volume 32 Issue 4

Full text available: [pdf\(245.12 KB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

Overlay networks have emerged as a powerful and highly flexible method for delivering content. We study how to optimize throughput of large transfers across richly connected, adaptive overlay networks, focusing on the potential of collaborative transfers between peers to supplement ongoing downloads. First, we make the case for an erasure-resilient encoding of the content. Using the digital fountain encoding approach, end-hosts can efficiently reconstruct the original content of size n from a ...


Keywords: Bloom filter, collaboration, content delivery, digital fountain, erasure correcting code, min-wise summary, overlay, peer-to-peer, reconciliation

15 Methods for message routing in parallel machines



Tom Leighton

July 1992 **Proceedings of the twenty-fourth annual ACM symposium on Theory of computing**


Full text available:  [pdf\(2.32 MB\)](#)

Additional Information: [full citation](#), [references](#), [citations](#), [index terms](#)

16 Efficient routing and scheduling algorithms for optical networks

Alok Aggarwal, Amotz Bar-Noy, Don Coppersmith, Rajiv Ramaswami, Baruch Schieber, Madhu Sudan

January 1994 **Proceedings of the fifth annual ACM-SIAM symposium on Discrete algorithms**

Full text available:  [pdf\(1.32 MB\)](#)

Additional Information: [full citation](#), [references](#), [citations](#), [index terms](#)

17 Deriving traffic demands for operational IP networks: methodology and experience

Anja Feldmann, Albert Greenberg, Carsten Lund, Nick Reingold, Jennifer Rexford, Fred True

August 2000 **ACM SIGCOMM Computer Communication Review , Proceedings of the conference on Applications, Technologies, Architectures, and Protocols for Computer Communication**, Volume 30 Issue 4

Full text available:  [pdf\(341.59 KB\)](#)

Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

Engineering a large IP backbone network without an accurate, network-wide view of the traffic demands is challenging. Shifts in user behavior, changes in routing policies, and failures of network elements can result in significant (and sudden) fluctuations in load. In this paper, we present a model of traffic demands to support traffic engineering and performance debugging of large Internet Service Provider networks. By defining a traffic demand as a volume of load originating from an ingress ...

18 From defects to failures: a view of dependable computing

Behrooz Parhami

September 1988 **ACM SIGARCH Computer Architecture News**, Volume 16 Issue 4

Full text available:  [pdf\(1.22 MB\)](#)

Additional Information: [full citation](#), [abstract](#), [index terms](#)

A unified framework and terminology for the study of computer system dependability is presented. Impairments to dependability are viewed from six abstraction levels. It is argued that all of these levels are useful, in the sense that proven dependability procurement techniques can be applied at each level, and that it is beneficial to have distinct, precisely defined terminology for describing impairments to and procurement strategies for computer system dependability at these levels. The six levels ...

19 Planar-adaptive routing: low-cost adaptive networks for multiprocessors

Andrew A. Chien, Jae H. Kim

January 1995 **Journal of the ACM (JACM)**, Volume 42 Issue 1

Full text available:  [pdf\(2.28 MB\)](#)

Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#), [review](#)


Network throughput can be increased by allowing multipath, adaptive routing. Adaptive routing allows more freedom in the paths taken by messages, spreading load over physical channels more evenly. The flexibility of adaptive routing introduces new possibilities of deadlock. Previous deadlock avoidance schemes in k-ary n-cubes require an exponential number of virtual channels. We describe a family of deadlock-free routing algorithms, called planar-ad ...

Keywords: adaptive routing, fault tolerance, interconnection networks, multicomputers, packet routing, parallel processing, transmission-order preservation

20 Wormhole routing techniques for directly connected multicomputer systems

Prasant Mohapatra

September 1998 **ACM Computing Surveys (CSUR)**, Volume 30 Issue 3

Full text available:  [pdf\(340.68 KB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

Wormhole routing has emerged as the most widely used switching technique in massively parallel computers. We present a detailed survey of various techniques for enhancing the performance and reliability of wormhole-routing schemes in directly connected networks. We start with an overview of the direct network topologies and a comparison of various switching techniques. Next, the characteristics of the wormhole routing mechanism are described in detail along with the theory behind deadlock-f ...

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John Colter, Netscape Navigator

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- Exclude pages by using a **-** if a search term must not appear on a page.

museum -Paris

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Published before July 2000

Terms used **path selection** **profile**

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1 [Speculative hedge: regulating compile-time speculation against profile variations](#)

Brian L. Deitrich, Wen-mei W. Hwu

 December 1996 **Proceedings of the 29th annual ACM/IEEE international symposium on Microarchitecture**

Full text available:

[pdf\(1.33 MB\)](#) [Publisher Site](#)

 Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

Path-oriented scheduling methods, such as trace scheduling and hyperblock scheduling, use speculation to extract instruction-level parallelism from control-intensive programs. These methods predict important execution paths in the current scheduling scope using execution profiling or frequency estimation. Aggressive speculation is then applied to the important execution paths, possibly at the cost of degraded performance along other paths. Therefore, the speed of the output code can be sensitive ...

2 [Superblock formation using static program analysis](#)

Richard E. Hank, Scott A. Mahlke, Roger A. Bringmann, John C. Gyllenhaal, Wen-mei W. Hwu

 December 1993 **Proceedings of the 26th annual international symposium on Microarchitecture**

Full text available:

[pdf\(999.79 KB\)](#)

 Additional Information: [full citation](#), [references](#), [citations](#)

Keywords: VLIW, code scheduling, optimization, static program analysis, superblock, superscalar

3 [Edge profiling versus path profiling: the showdown](#)

Thomas Ball, Peter Mataga, Mooly Sagiv

 January 1998 **Proceedings of the 25th ACM SIGPLAN-SIGACT symposium on Principles of programming languages**

Full text available:

[pdf\(1.84 MB\)](#)


 Additional Information: [full citation](#), [references](#), [citations](#), [index terms](#)

4 [Expert design tools for physical database design](#)

Rajiv Tewari

 September 1990 **Proceedings of the 1990 ACM SIGBDP conference on Trends and**

directions in expert systems

Full text available:  [pdf\(926.35 KB\)](#) Additional Information: [full citation](#), [references](#), [index terms](#)

5 Routing with end-to-end QoS guarantees in broadband networks

Ariel Orda

June 1999 **IEEE/ACM Transactions on Networking (TON)**, Volume 7 Issue 3


Full text available:  [pdf\(209.52 KB\)](#) Additional Information: [full citation](#), [references](#), [citations](#), [index terms](#)

Keywords: QoS routing, constrained path optimization, hierarchical networks, rate-based schedulers, topology aggregation

6 STATEMATE applied to statistical software testing

P. Thévenod-Fosse, H. Waeselynck

July 1993 **ACM SIGSOFT Software Engineering Notes , Proceedings of the 1993 ACM SIGSOFT international symposium on Software testing and analysis**, Volume 18 Issue 3

Full text available:  [pdf\(1.31 MB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

This paper is concerned with the use of statistical testing as a verification technique for complex software. Statistical testing involves exercising a program with random inputs, the test profile and the number of generated inputs being determined according to criteria based on program structure or software functionality. In case of complex programs, the probabilistic generation must be based on a black box analysis, the adopted criteria being defined from behavior model ...

7 Integrated program measurement and documentation tools

Anne Schroeder

March 1984 **Proceedings of the 7th international conference on Software engineering**

Full text available:  [pdf\(703.65 KB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

This paper describes an attempt to integrate the collection and the efficient utilisation of measurements in the development and the use of programs. The work presented consists in three parts: - the design of both static and dynamic measurement tools, - examples of data processing on measurements collected on a sample of Pascal programs, - the design of a quantitative documentation of a program, which is automatically built as measurements are collected.

8 Using formal specifications as test oracles for system-critical software

Jon Hagar, James M. Bieman

November 1996 **ACM SIGAda Ada Letters**, Volume XVI Issue 6

Full text available:  [pdf\(1.15 MB\)](#) Additional Information: [full citation](#), [abstract](#), [index terms](#)

The process used to validate, verify, and test flight avionics control systems has produced software that is highly reliable. However, ever greater demands for reliability require new automated tools to improve existing processes. We used the Anna (Annotated Ada) formal specification language and supporting tool set to develop a Test Range Oracle Tool (TROT) to automate the testing of equation execution. Our approach fits within the existing testing process, automates perviously manual analysis, ...

Keywords: Ada, annotated Ada, formal specifications, industrial software, process improvement, spec language, test oracle, testing process, verification & validation

9 Statistical profile estimation in database systems

Michael V. Mannino, Paicheng Chu, Thomas Sager
September 1988 **ACM Computing Surveys (CSUR)**, Volume 20 Issue 3


Full text available:  pdf(2.94 MB)

Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

A statistical profile summarizes the instances of a database. It describes aspects such as the number of tuples, the number of values, the distribution of values, the correlation between value sets, and the distribution of tuples among secondary storage units. Estimation of database profiles is critical in the problems of query optimization, physical database design, and database performance prediction. This paper describes a model of a database of profile, relates this model to estimating ...

10 An online computation of critical path profiling


Jeffrey K. Hollingsworth
January 1996 **Proceedings of the SIGMETRICS symposium on Parallel and distributed tools**

Full text available:  pdf(1.00 MB)

Additional Information: [full citation](#), [references](#), [citations](#), [index terms](#)

11 The use of program profiling for software maintenance with applications to the year 2000 problem


Thomas Reps, Thomas Ball, Manuvir Das, James Larus
November 1997 **ACM SIGSOFT Software Engineering Notes , Proceedings of the 6th European conference held jointly with the 5th ACM SIGSOFT international symposium on Foundations of software engineering**, Volume 22 Issue 6

Full text available:  pdf(1.85 MB)

Additional Information: [full citation](#), [references](#), [citations](#), [index terms](#)

12 An instant and accurate size estimation method for joins and selections in a retrieval-intensive environment

Wei Sun, Yibei Ling, Naphtali Rishe, Yi Deng
June 1993 **ACM SIGMOD Record , Proceedings of the 1993 ACM SIGMOD international conference on Management of data**, Volume 22 Issue 2

Full text available:  pdf(1.05 MB)

Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

This paper proposes a novel strategy for estimating the size of the resulting relation after an equi-join and selection using a regression model. An approximating series representing the underlying data distribution and dependency is derived from the actual data. The proposed method provides an instant and accurate size estimation by performing an evaluation of the series, with no run-time overheads in page faults and space, and with negligible CPU overhead. In contrast, the popular ...

13 A piggyback method to collect statistics for query optimization in database management systems

Qiang Zhu, Brian Dunkel, Nandit Soparkar, Suyun Chen, Berni Schiefer, Tony Lai
November 1998 **Proceedings of the 1998 conference of the Centre for Advanced Studies on Collaborative research**

Full text available:  [pdf\(328.82 KB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

A database management system (DBMS) performs query optimization based on statistical information about data in the underlying data-base. Out-of-date statistics may lead to inefficient query processing in the system. Existing solutions to this problem have some drawbacks such as heavy administrative burden, high system load, and tardy updates. To overcome these drawbacks, our new approach, called the piggyback method, is proposed in this paper. The key idea is to piggyback some additional retrieval ...

Keywords: access method, cost estimation, database management system, piggyback analysis, query optimization, statistics collection

14 Multidatabase systems: Interchanging group-by and join in distributed query processing

Weipeng Paul Yan

October 1993 **Proceedings of the 1993 conference of the Centre for Advanced Studies on Collaborative research: distributed computing - Volume 2**

Full text available:  [pdf\(567.73 KB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#)

In previous work we have shown that the order of evaluating join and group-by can be interchanged in an SQL query under certain conditions. In many cases, performing group-by before join is a better way of evaluating the query. However, queries do exist for which it is better to perform join before group-by. When the conditions for interchanging the order of join and group-by for an SQL query are satisfied, the evaluation order should be determined mainly by the objective function of the query p ...

15 Query optimization

Yannis E. Ioannidis


March 1996 **ACM Computing Surveys (CSUR)**, Volume 28 Issue 1

Full text available:  [pdf\(185.93 KB\)](#) Additional Information: [full citation](#), [references](#), [citations](#), [index terms](#)

16 Query optimization in a memory-resident domain relational calculus database system

Kyu-Young Whang, Ravi Krishnamurthy

March 1990 **ACM Transactions on Database Systems (TODS)**, Volume 15 Issue 1

Full text available:  [pdf\(2.46 MB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

We present techniques for optimizing queries in memory-resident database systems. Optimization techniques in memory-resident database systems differ significantly from those in conventional disk-resident database systems. In this paper we address the following aspects of query optimization in such systems and present specific solutions for them: (1) a new approach to developing a CPU-intensive cost model; (2) new optimization strategies for main-memory query processing; (3) new insight into ...

17 A comparison of selectivity estimators for range queries on metric attributes

Björn Blohsfeld, Dieter Korus, Bernhard Seeger

June 1999 **ACM SIGMOD Record , Proceedings of the 1999 ACM SIGMOD international conference on Management of data**, Volume 28 Issue 2

Full text available:  [pdf\(1.53 MB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

In this paper, we present a comparison of nonparametric estimation methods for computing approximations of the selectivities of queries, in particular range queries. In contrast to

previous studies, the focus of our comparison is on metric attributes with large domains which occur for example in spatial and temporal databases. We also assume that only small sample sets of the required relations are available for estimating the selectivity. In addition to the popular histogram estimators, ou ...

18 Multiple-granularity interleaving for piggyback query processing

Brian Dunkel, Qiang Zhu, Wing Lau, Suyun Chen

November 1999 **Proceedings of the 1999 conference of the Centre for Advanced Studies on Collaborative research**

Full text available:  [pdf\(353.91 KB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

Piggyback query processing is a new technique, described in [24], intended to perform additional useful computation (e.g., database statistics collection) during normal query processing, taking full advantage of data resident in main memory. Different types of beneficial piggybacking have been identified and studied, but how to efficiently integrate piggyback operations with a given user query is still an open issue. In this paper, we propose a technique of multiple-granularity interleaving to effi ...

Keywords: database statistics, multiple-granularity interleaving, piggybacking, query optimization, query processing

19 Improved histograms for selectivity estimation of range predicates

Viswanath Poosala, Peter J. Haas, Yannis E. Ioannidis, Eugene J. Shekita

June 1996 **ACM SIGMOD Record , Proceedings of the 1996 ACM SIGMOD international conference on Management of data**, Volume 25 Issue 2

Full text available:  [pdf\(1.35 MB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

Many commercial database systems maintain histograms to summarize the contents of relations and permit efficient estimation of query result sizes and access plan costs. Although several types of histograms have been proposed in the past, there has never been a systematic study of all histogram aspects, the available choices for each aspect, and the impact of such choices on histogram effectiveness. In this paper, we provide a taxonomy of histograms that captures all previously proposed histogram ...

20 On the propagation of errors in the size of join results

Yannis E. Ioannidis, Stavros Christodoulakis

April 1991 **ACM SIGMOD Record , Proceedings of the 1991 ACM SIGMOD international conference on Management of data**, Volume 20 Issue 2

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1 [METRO: a router architecture for high-performance, short-haul routing networks](#)

A. DeHon, F. Chong, M. Becker, E. Egozy, H. Minsky, S. Peretz, T. F. Knight

 April 1994 **ACM SIGARCH Computer Architecture News , Proceedings of the 21ST annual international symposium on Computer architecture**, Volume 22 Issue 2
Full text available: [pdf\(1.15 MB\)](#)
 Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

The *Multipath Enhanced Transit Router Organization (METRO)* is a flexible routing architecture for high-performance, tightly-coupled, multiprocessors and routing hubs. A *METRO* router is a dilated cross-bar routing component supporting half-duplex bidirectional, pipelined, circuit-switched connections. Each *METRO* router is self-routing and supports dynamic message traffic. The routers works in conjunction with source-responsible network interfaces to achieve reliable en ...

2 [A constant-factor approximation algorithm for packet routing, and balancing local vs. global criteria](#)

Aravind Srinivasan, Chung-Piaw Teo

 May 1997 **Proceedings of the twenty-ninth annual ACM symposium on Theory of computing**
Full text available: [pdf\(1.32 MB\)](#)
 Additional Information: [full citation](#), [references](#), [citations](#), [index terms](#)

Keywords: approximation algorithms, covering integer programs, discrete ham-sandwich theorems, linear programming, packet routing, randomized algorithms, randomized rounding, rounding theorems

3 [Design and performance of multipath MIN architectures](#)

Frederic T. Chong, Thomas F. Knight

 June 1992 **Proceedings of the fourth annual ACM symposium on Parallel algorithms and architectures**
Full text available: [pdf\(1.05 MB\)](#)
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4 [Scalable expanders: exploiting hierarchical random wiring](#)

Eric A. Brewer, Frederic T. Chong, Tom Leighton


May 1994 **Proceedings of the twenty-sixth annual ACM symposium on Theory of computing**

Full text available:  [pdf\(941.42 KB\)](#) Additional Information: [full citation](#), [references](#), [citations](#), [index terms](#)

5 Efficient routing in optical networks

Alok Aggarwal, Amotz Bar-Noy, Don Coppersmith, Rajiv Ramaswami, Baruch Schieber, Madhu Sudan

November 1996 **Journal of the ACM (JACM)**, Volume 43 Issue 6

Full text available:  [pdf\(559.18 KB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#), [review](#)

This paper studies the problem of dedicating routes to connections in optical networks. In optical networks, the vast bandwidth available in an optical fiber is utilized by partitioning it into several channels, each at a different optical wavelength. A connection between two nodes is assigned a specific wavelength, with the constraint that no two connections sharing a link in the network can be assigned the same wavelength. This paper considers optical networks with and without switches, a ...

Keywords: optical networks, routing, wavelength assignment

6 Methods for message routing in parallel machines

Tom Leighton

July 1992 **Proceedings of the twenty-fourth annual ACM symposium on Theory of computing**

Full text available:  [pdf\(2.32 MB\)](#) Additional Information: [full citation](#), [references](#), [citations](#), [index terms](#)

7 Efficient routing and scheduling algorithms for optical networks

Alok Aggarwal, Amotz Bar-Noy, Don Coppersmith, Rajiv Ramaswami, Baruch Schieber, Madhu Sudan


January 1994 **Proceedings of the fifth annual ACM-SIAM symposium on Discrete algorithms**

Full text available:  [pdf\(1.32 MB\)](#) Additional Information: [full citation](#), [references](#), [citations](#), [index terms](#)

8 From defects to failures: a view of dependable computing

Behrooz Parhami

September 1988 **ACM SIGARCH Computer Architecture News**, Volume 16 Issue 4

Full text available:  [pdf\(1.22 MB\)](#) Additional Information: [full citation](#), [abstract](#), [index terms](#)

A unified framework and terminology for the study of computer system dependability is presented. Impairments to dependability are viewed from six abstraction levels. It is argued that all of these levels are useful, in the sense that proven dependability procurement techniques can be applied at each level, and that it is beneficial to have distinct, precisely defined terminology for describing impairments to and procurement strategies for computer system dependability at these levels. The six le ...

9 Planar-adaptive routing: low-cost adaptive networks for multiprocessors

Andrew A. Chien, Jae H. Kim

January 1995 **Journal of the ACM (JACM)**, Volume 42 Issue 1

Full text available:  [pdf\(2.28 MB\)](#)Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#), [review](#)

Network throughput can be increased by allowing multipath, adaptive routing. Adaptive routing allows more freedom in the paths taken by messages, spreading load over physical channels more evenly. The flexibility of adaptive routing introduces new possibilities of deadlock. Previous deadlock avoidance schemes in k-ary n-cubes require an exponential number of virtual channels. We describe a family of deadlock-free routing algorithms, called planar-ad ...

Keywords: adaptive routing, fault tolerance, interconnection networks, multicomputers, packet routing, parallel processing, transmission-order preservation

10 [Wormhole routing techniques for directly connected multicomputer systems](#)


Prasant Mohapatra

September 1998 **ACM Computing Surveys (CSUR)**, Volume 30 Issue 3Full text available:  [pdf\(340.68 KB\)](#)Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

Wormhole routing has emerged as the most widely used switching technique in massively parallel computers. We present a detailed survey of various techniques for enhancing the performance and reliability of wormhole-routing schemes in directly connected networks. We start with an overview of the direct network topologies and a comparison of various switching techniques. Next, the characteristics of the wormhole routing mechanism are described in detail along with the theory behind deadlock-f ...

11 [Improved routing and sorting on multibutterflies](#)

Bruce M. Maggs, Berthold Vöcking

May 1997 **Proceedings of the twenty-ninth annual ACM symposium on Theory of computing**Full text available:  [pdf\(1.86 MB\)](#)Additional Information: [full citation](#), [references](#), [index terms](#)

12 [Adaptive wavelength routing in all-optical networks](#)


Ahmed Mokhtar, Murat Azizoğlu

April 1998 **IEEE/ACM Transactions on Networking (TON)**, Volume 6 Issue 2Full text available:  [pdf\(263.43 KB\)](#)Additional Information: [full citation](#), [references](#), [citations](#), [index terms](#)

Keywords: adaptive routing, all-optical networks, blocking performance, wavelength assignment, wavelength routing

13 [Fast computation using faulty hypercubes](#)

J. Hastad, T. Leighton

February 1989 **Proceedings of the twenty-first annual ACM symposium on Theory of computing**Full text available:  [pdf\(1.65 MB\)](#)Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)


We consider the computational power of a hypercube containing a potentially large number of randomly located faulty components. We describe a randomized algorithm which embeds an N-node hypercube in an N-node hypercube with faulty processors. Provided that the processors of the N-node hypercube are faulty with probability $p < 1$, and that the faults are

independently distributed, we show that with high probability, the fa ...

14 VAXcluster: a closely-coupled distributed system

Nancy P. Kronenberg, Henry M. Levy, William D. Strecker

May 1986 **ACM Transactions on Computer Systems (TOCS)**, Volume 4 Issue 2

Full text available:  [pdf\(1.25 MB\)](#)

Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

A VAXcluster is a highly available and extensible configuration of VAX computers that operate as a single system. To achieve performance in a multicomputer environment, a new communications architecture, communications hardware, and distributed software were jointly designed. The software is a distributed version of the VAX/VMS operating system that uses a distributed lock manager to synchronize access to shared resources. The communications hardware includes a 70 megabit per second message ...

15 Mariposa: a wide-area distributed database system

Michael Stonebraker, Paul M. Aoki, Witold Litwin, Avi Pfeffer, Adam Sah, Jeff Sidell, Carl Staelin, Andrew Yu

January 1996 **The VLDB Journal — The International Journal on Very Large Data Bases**, Volume 5 Issue 1

Full text available:  [pdf\(172.75 KB\)](#)

Additional Information: [full citation](#), [abstract](#), [citations](#), [index terms](#)


The requirements of wide-area distributed database systems differ dramatically from those of local-area network systems. In a wide-area network (WAN) configuration, individual sites usually report to different system administrators, have different access and charging algorithms, install site-specific data type extensions, and have different constraints on servicing remote requests. Typical of the last point are production transaction environments, which are fully engaged during normal business h ...

Keywords: Autonomy, Databases, Distributed systems, Economic site, Name service, Wide-area network

16 Fast algorithms for bit-serial routing on a hypercube

B. Aiello, F. T. Leighton, B. Maggs, M. Newman

May 1990 **Proceedings of the second annual ACM symposium on Parallel algorithms and architectures**


Full text available:  [pdf\(1.11 MB\)](#)

Additional Information: [full citation](#), [references](#), [citations](#), [index terms](#)

17 A survey of PRAM simulation techniques

Tim J. Harris

June 1994 **ACM Computing Surveys (CSUR)**, Volume 26 Issue 2

Full text available:  [pdf\(1.70 MB\)](#)


Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

The Parallel Random Access Machine (PRAM) is an abstract model of parallel computation which allows researchers to focus on the essential characteristics of a parallel architecture and ignore other details. The PRAM has long been acknowledged to be a useful tool for the study of parallel computing, but unfortunately it is not physically implementable in hardware. In order to take advantage of the broad base of algorithms and results regarding this high-level abstraction one needs general me ...

Keywords: bounded-degree networks, models of parallel computation, parallel complexity theory

18 Abstracts in software engineering

Software Engineering Notes Staff

July 1984 **ACM SIGSOFT Software Engineering Notes**, Volume 9 Issue 4Full text available:  [pdf\(360.06 KB\)](#)Additional Information: [full citation](#)**19 Fault-tolerant circuit-switching networks**

Nicholas Pippenger, Geng Lin

June 1992 **Proceedings of the fourth annual ACM symposium on Parallel algorithms and architectures**Full text available:  [pdf\(769.34 KB\)](#)Additional Information: [full citation](#), [references](#), [index terms](#)**20 Comparing random data allocation and data striping in multimedia servers**

Jose Renato Santos, Richard R. Muntz, Berthier Ribeiro-Neto

June 2000 **ACM SIGMETRICS Performance Evaluation Review , Proceedings of the 2000 ACM SIGMETRICS international conference on Measurement and modeling of computer systems**, Volume 28 Issue 1Full text available:  [pdf\(1.18 MB\)](#)Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

We compare performance of a multimedia storage server based on a random data allocation layout and block replication with traditional data striping techniques. Data striping techniques in multimedia servers are often designed for restricted workloads, e.g. sequential access patterns with CBR (constant bit rate) requirements. On the other hand, a system based on random data allocation can support virtually any type of multimedia application, including VBR (variable bit rate) video or audio, ...

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John Colter, Netscape Navigator

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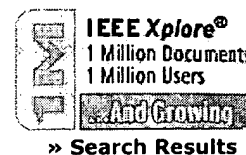
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